

REMARKS

Favorable reconsideration of this application in light of the preceding amendments and the following remarks is requested.

No claims having been cancelled or added, the Applicants submit that claims 1-37 remain pending in this application with 1-34 remaining under consideration in this application in light of the withdrawal from consideration of claims 35-37.

Rejections under 35 U.S.C. § 102

Claims 1, 5 and 10 stand rejected under 35 U.S.C. § 102(e) as anticipated by Amos et al.'s U.S. Patent No. 6,846,734 ("Amos"). The Applicants again traverse this rejection for the reasons detailed below.

The Applicants again note that the mere fact that a certain result or characteristic may occur or be present in some combination of the prior art disclosure is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993). Indeed, in order to establish inherency, a disclosure must make clear that the missing element would necessarily be present and that it would be so recognized as such by persons of ordinary skill. Inherency is not, however, established by mere probabilities or possibilities. *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999). As in this instance, the disclosure of a broad range of possibilities or a genus, without any guidance or teaching sufficient to lead one skilled in the art to the claimed invention does not "inherently" disclose any specific combination of the various elements or a species that provides unexpected results, but merely invites further experimentation. *Metabolite Labs., Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354, 1367 (Fed. Cir. 2004).

The Applicants further note that the only example provided by Amos utilized a metal layer of Co with Sn as the alloying metal. The Applicants further note that the teachings provided by Amos focus on the alloying materials and/or the use of bilayers for controlling or tuning the threshold voltages of associated MOSFETs. The Applicants contend, therefore, that one skilled in the art and guided by Amos seeking to obtain a two-layer structure would adopt the "bilayer" approach using two separate depositions rather than attempting to achieve segregation of the primary metal and alloying metals.

In this instance, the Examiner has generally alleged that “based on the processes conducted” in Amos, Action at 2, the method recited in claim 1 will inherently be achieved. The Applicants note, however, that in order to rely on a theory of inherency, the Examiner “must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic *necessarily* flows from the teachings of the applied prior art.” *Ex parte Levy*, 17 USPQ2d 1461, 1464 (B.P.A.I. 1990) (emphasis in original). Once again the Applicants note that Amos provides only broad ranges of materials, thickness and operating conditions from which one skilled in the art could select, but does not provide any explicit guidance, preferred embodiments or specific examples that would *necessarily* lead one skilled in the art to a combination capable of producing the two-layered structure recited in claim 1. The Applicants maintain, therefore, that an anticipation rejection cannot be maintained on the teachings of this reference unless and until some *specific* teaching is identified in Amos with respect to the formation of the two-layered structure.

Accordingly, the Applicants request that this rejection be reconsidered and withdrawn.

Claims 1, 15, 21, 25, 31 and 32 stand rejected under 35 U.S.C. § 102(e) as anticipated by Paton et al.’s U.S. Patent No. 6,797,614 (“Paton”). The Applicants again traverse this rejection for the reasons detailed below.

The Applicants incorporate the discussion above with regard to the requirements of a valid application of “inherency” to support a rejection in light of prior art teachings. In this instance, the Applicants again note that Paton, like Amos, broadly discloses ranges of materials and processes in connection with a silicidation process, but that Paton, like Amos, does not teach or suggest that segregation of the primary metal and the alloying metal may be achieved, is in any way desirable, or even that such an occurrence is possible.

The Applicants note that Paton is directed to a method of suppressing the formation of germanosilicides that may result from the presence of germanium atoms in a strained silicon lattice through the incorporation of an alloying metal, specifically vanadium, tungsten and tantalum. Paton, col. 2, lines 31-50. The Applicants note that Paton provides for a silicidation temperature in the range of 400-600° C., Paton, col. 5, lines 63-65, and apparently tolerates a wide range of alloy compositions, *i.e.*, 1-30%, Paton, col. 5, lines 23-26. The Applicants also note that Paton, like Amos, provides for an alternative bilayer structure in which the primary metal and the alloying metal are deposited separately and then combined at, for example 400-700° C., Paton, col. 5, lines 37-55.

In light of Paton's disclosure, the Applicants contend that no portion of Paton has been shown to teach or suggest that any of the combinations of composition and temperature contemplated by Paton produced the claimed two-layer structure. Indeed, the Applicants contend that Paton plainly teaches that rather than such segregation occurring, Paton, col. 5, lines 37-55, the recommended thermal processes will tend to form an alloy layer from adjacent and sequentially deposited layers of a primary metal and an alloying metal.

Accordingly, the Applicants contend that Paton teaches that the segregation required to obtain the structure recited in the pending claims will not occur at the concentrations and temperatures deemed suitable by Paton. The Applicants contend that it is wholly improper to maintain an "inherency" argument to "find" support for a result this is *directly contrary* to that described as being achieved by the disclosed method. To the extent that the parameters necessary to achieve the recited step of forming a "nickel silicide layer having an upper layer and a lower layer" according to claim 1 could be encompassed by Paton's broad disclosure, the Applicants maintain that Paton provides no suggestion that such a result is possible or even how to go about determining what combination of parameters would be successful in achieving such a result.

Absent such teachings, the Applicants maintain that Paton cannot fairly be said to anticipate, *i.e.*, disclose every limitation as recited in the claims, because one skilled in the art would receive no guidance regarding the selection from among the many possible combinations and would, therefore, have no reasonable expectation of obtaining a method that could achieve the recited two-layer nickel silicide structure resulting from nickel alloy segregation during the formation of the silicide.

Accordingly, the Applicants request that this rejection be reconsidered and withdrawn.

Rejections under 35 U.S.C. § 103

Claims 2-4, 6-9 and 11-14 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Amos. The Applicants again traverse this rejection for the reasons detailed below.

The Applicants incorporate herein the discussion above regarding the breadth of the Amos disclosure and its lack of any teachings regarding combinations that would produce a two-layer structure by inducing segregation of a primary metal and an alloying metal during formation of a silicide. With respect to the Examiner's contention regarding "routine experimentation" for determining the "optimum relative thicknesses," the Applicants note that only "result effective" parameters, *i.e.*, those parameters which correlate to a recognized result, may be optimized through "routine experimentation." *In re Antonie*, 559 F.2d 618 (CCPA 1977).

The Applicants contend that the Examiner has again failed to demonstrate that the segregation of the alloy layer during the silicidation process is a "result effective" parameter. The Applicants further contend that general allusions to the sheet resistance of the resulting silicide layer, Action at 4, are not sufficient to provide any evidence of a recognized correlation between the recited segregation and the sheet resistance to render the segregated layers a "result effective" parameter.

Accordingly, the Applicants request that this rejection be reconsidered and withdrawn.

Claims 2-4, 7-9, 16-18, 26, 28-30 and 33-34 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Paton et al's U.S. Patent No. 6,797,614 ("Paton"). The Applicants traverse this rejection for the reasons detailed below.

The Applicants, as discussed above, contend that the Examiner has not demonstrate that the segregation of the alloy layer during the silicidation process is a "result effective" parameter. The Applicants further contend that general allusions to the sheet resistance of the resulting silicide layer, Action at 5, are not sufficient to provide any evidence of a recognized correlation between the recited segregation and the sheet resistance to render the segregated layers a "result effective" parameter.

Accordingly, the Applicants request that this rejection be reconsidered and withdrawn.

Claims 5-6, 10-14, 19-20 and 27 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Paton in view of Amos. The Applicants traverse this rejection for the reasons detailed below.

The Applicants incorporate herein the discussion above regarding the breadth of the Paton and Amos disclosures and their absolute silence as to the formation of a two-layer structure by inducing segregation of a primary metal and an alloying metal during formation of a silicide. The Applicants contend that the proposed addition of

Amos does not remedy the noted deficiencies in the Paton disclosure with respect to the basic elements of the claimed methods.

Accordingly, the Applicants request that this rejection be reconsidered and withdrawn.

Claims 22-24 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Paton in view of Chittipeddi et al's U.S. Patent No. 6,498,080. The Applicants traverse this rejection for the reasons detailed below.

The Applicants incorporate herein the discussion above regarding the breadth of the Paton disclosure and its failure to teach or suggest the formation of a two-layer structure by inducing segregation of a primary metal and an alloying metal during formation of a silicide. The Applicants contend that the proposed addition of Chittipeddi does not remedy the noted deficiencies in the Paton disclosure with respect to the basic elements of the claimed methods.

Accordingly, the Applicants request that this rejection be reconsidered and withdrawn.

Comments on Response to Arguments

As noted above, the Applicants contend that in the absence of any specific example or embodiment that will produce the recited two-layer structure, reliance on overlapping ranges to define an "embodiment" for an "inherent" anticipation rejection under 35 U.S.C. § 102 is inappropriate.

With regard to the “Payton” [sic] reference, Action at 7, the Applicants suggest that if the Examiner intends to rely on a single embodiment, the cited portions of the reference text should be specific to that embodiment. The Applicants note that in this instance, the portion of Paton cited in the Office Action of November 15, 2005, Paton, col. 5, line 9, to col. 6, line 2, clearly encompasses Paton’s discussion of the “bi-layer” fabrication method, col. 5, lines 37-55, for the formation of layer 47 that the Applicants suggest illustrates that segregation was not observed or achieved by Paton for the alternative alloy compositions. Similarly, the Applicants contend that nothing in Paton’s FIG. 6 suggests the presence of a two-layer structure in silicide regions 64, 66 or 68. Accordingly, the Applicants maintain that the cited portions of Paton do not show or teach the recited structure. The Applicants also contend that it is both fair and appropriate to consider a reference for all that it teaches because one of skill in the art would not have the benefit of the present application to guide their hindsight selection from among the broad range of possible combinations disclosed in the reference in order to achieve the claimed invention.

The Applicants again note that the MPEP and related case law make clear that only “result-effective” variables are subject to being “optimized during routine experimentation.” Accordingly, the Applicants contend that a particular parameter *must* first be recognized as a result-effective variable, *i.e.*, a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, (CCPA 1977); *see also*, MPEP § 2144.05. The Applicants maintain, therefore, that there *must* be some showing that a variable and its relationship to a desired condition or

parameter have previously been recognized in the art *before* such a parameter can fairly be characterized as a “result-effective” variable.

The Applicants maintain, therefore, that it is improper to attempt to leverage an “inherency” argument into a recognition by those skilled in the art of the degree of segregation of the alloy layer or the relative thicknesses of the resulting layers is sufficiently tied to any other property or parameter to be construed as a “result-effective” variable. Indeed, the Applicants contend that no unknown or unrecognized feature can ever fairly be characterized as a “result-effective” variable, *i.e.*, one that achieves a recognized result because of this lack of correlation to a desired trait. The Applicants maintain, therefore, that the alleged “inherency” of the two-layer structure cannot be transformed into “recognition” by those skilled in the art of the segregation of the alloy layer or the relative thicknesses of the resulting upper and lower layers as “result-effective” variables.

CONCLUSION

In view of the above remarks and amendments, the Applicants submit that each of the pending objections and rejections have been addressed and overcome, leaving the present application in condition for allowance. A notice to that effect is requested.

If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to contact the undersigned.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge any underpayment or non-payment of any fees required under 37 C.F.R. §§ 1.16 or 1.17, or credit any overpayment of such fees, to Deposit Account No. 08-0750, including, in particular, extension of time fees.

Respectfully submitted,

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